RELAYS
AF, AG, AND AJ TYPES
(WIRE-SPRING TYPES)
REQUIREMENTS
(CONDENSED SECTION FOR 040-502-701)

1. REQUIREMENTS (also see Section 020-012-711)

1.01 *Contact Cover Clearance:* Contact cover clears card with cover pushed against stops.

1.02 *Armature Position:* Fig. 1 (A)—Armature hinge spring legs, where secured to armature, bear against outer core legs; relay operated and unoperated.
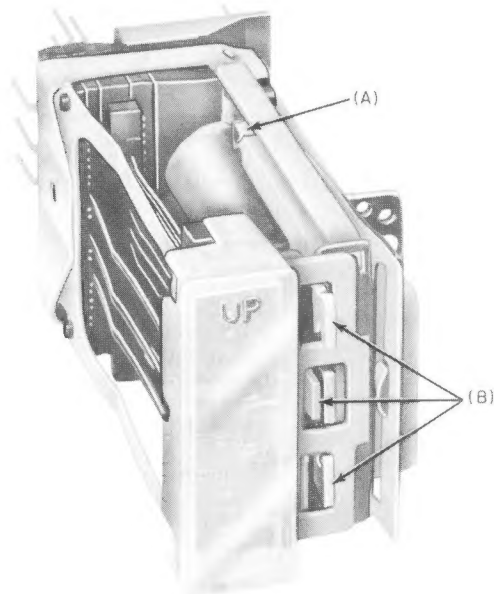

Fig. 1 — AJ-Type Relay

1.03 *Balancing Spring Tension:* Fig. 1(B)—Card bears against associated surfaces on armature and armature bears against backstop; relay unoperated.

1.04 *Armature Back Tension:* Armature bears against backstop.

(a) *AF-Type and 12-Position AJ-Type:* Min 25 grams (readjust 30 grams; max 60 grams not applicable if nonoperate or release electrical requirements are specified). 70D or 70J gauge.

(b) *24-Position AJ-Type:* Min 40 grams (readjust 45 grams; max 80 grams not applicable if nonoperate or release electrical requirements are specified). 70D or 70J gauge.

(c) *AG-Type:* Min 15 grams (readjust 20 grams). 70D gauge.

1.05 *Contact Make and Break*

(a) Both contacts of movable twin springs make in operated position for make contacts and in unoperated position for break contacts.

(b) With relay energized against 171A gauge, except where noted, make and break contacts meet following requirements.

TEST

(1) *Before Turnover:* (Refer to Section 040-502-701 for requirements.)

(2) *After Turnover:*

MAKE CONTACTS	NEITHER PAIR OF CONTACTS MAKE ALL RELAYS (INCH)	AT LEAST ONE PAIR OF CONTACTS MAKE ALL RELAYS (INCH)
Spring combination No. 1 to 199, 500 and up	†#0.007	0.0015
Spring combination No. 200 to 399	#0.007	0.0015
Spring combination No. 400 to 499	#0.010	0.0015

BREAK CONTACTS	AT LEAST ONE PAIR OF CONTACTS DO NOT BREAK ALL RELAYS (INCH)	BOTH PAIRS OF CONTACTS BREAK ALL RELAYS (INCH)
Spring combination No. 1 to 199, 500 and up	†#0.007	0.0015
Spring combination No. 200 to 399	#0.007	0.0015
Spring combination No. 400 to 499	#0.010	0.0015

\# Gauge inserted between armature and backstop.

† For relays having six or less pairs of movable twin springs, requirement is met with 0.0045-inch gauge inserted between armature and backstop.

READJUST

MAKE CONTACTS	NEITHER PAIR OF CONTACTS MAKE TYPE RELAY		AT LEAST ONE PAIR OF CONTACTS MAKE TYPE RELAY	
	AF	AG & AJ (INCH)	AF	AG & AJ (INCH)
M (Make)	0.012	0.0145	0.0045	0.005
EM (Early Make)	0.0215	0.0255	0.0135	0.016
PM (Preliminary Make)	0.031	0.0365	0.023	0.027

BREAK CONTACTS	AT LEAST ONE PAIR OF CONTACTS DO NOT BREAK TYPE RELAY		BOTH PAIRS OF CONTACTS BREAK TYPE RELAY	
	AF	AG & AJ (INCH)	AF	AG & AJ (INCH)
B (Break)	‡0.012	‡0.0145	0.0045	0.005
EB (Early Break)	0.0215	0.0255	0.0135	0.016
PB (Preliminary Break)	0.031	0.0365	0.023	0.027

‡ Relays having spring combination No. 1 to 199 and 500 and up with 7 or more pairs of movable twin springs also meet specified condition with 0.007-inch gauge inserted between armature and backstop.

1.06 *Contact Sequence*

TEST

(a) *EMB Position:* EM contacts make before B contacts break.

(b) *EBM Position:* EB contacts break before M contacts make.

(c) *PMEB Position:* PM contacts make before EB contacts break.

(d) *PBEM Position:* PB contacts break before EM contacts make.

(e) *EM, EB, PM, and PB Position:* Check sequence if note on circuit requirement table so specifies.

Readjust: Covered by readjust requirment 1.05.

1.07 *Buffer Spring Position*

(a) With relay energized against 171A gauge, buffer spring meets conditions covered below.

	TYPE RELAY	NO MOVEMENT (INCH)	PERCEPTIBLE MOVEMENT (INCH)
Test (After Turnover)	All Relays	—	0.0015
Readjust	AF	0.007	0.003
	AG & AJ	0.0085	0.0035

*For before turnover requirement, refer to Section 040-502-701.

(b) *Buffer Spring Positioned by Core Plate:* Portion of spring between positioning lugs rests against core plate; relay operated and unoperated.

(c) Buffer spring not used; card should not touch spring operating lug; relay operated.

1.08 *Buffer Spring Tension:* Min 20 grams (readjust 25 grams). 70D gauge.

TABLE A — SPRING COMBINATION FIGURE NUMBERS AND CONTACT POSITIONS

CONTACT POSITIONS	SPRING COMBINATION FIGURE NUMBERS									
	1	2	3	4	5	6	7	8	9	10
12	—	—	—	—	M	M	M	M	—	—
11	—	—	—	—	—	M	M	M	—	—
10	—	—	M	M	M	M	M	M	—	—
9	—	—	—	—	—	M	M	M	—	—
8	—	M	M	M	M	M	M	M	—	—
7	—	—	—	—	—	—	—	M	B	B
6	M	M	M	M	M	M	M	M	M	M
5	—	—	—	—	—	—	M	M	—	B
4	—	—	M	M	M	M	M	M	—	—
3	—	—	—	—	—	M	M	M	—	—
2	—	—	—	M	M	M	M	M	—	—
1	—	—	—	—	—	M	M	M	—	—
	11	12	13	14	15	16	17	18	19	20
12	—	M	M	M	M	M	—	—	M	M
11	—	—	—	M	M	M	—	—	—	M
10	M	M	M	M	M	M	—	M	BM	M
9	—	—	—	—	M	M	—	—	—	—
8	M	M	M	M	M	M	M	BM	BM	BM
7	B	B	B	B	B	B	—	—	—	—
6	M	M	M	M	M	M	BM	BM	BM	BM
5	—	—	B	—	—	B	—	—	—	—
4	M	M	M	M	M	M	—	M	BM	M
3	—	—	—	M	M	M	—	—	—	M
2	M	M	M	M	M	M	—	—	M	M
1	—	—	—	M	M	M	—	—	M	M
	21	22	23	24	25	26	27	28	29	30
12	M	—	—	—	M	M	M	M	M	M
11	M	—	B	—	—	M	—	B	M	—
10	M	—	—	BM	BM	BM	M	BM	M	M
9	M	—	B	B	—	M	—	B	—	—
8	BM	BM	—	BM	BM	BM	BM	BM	M	M
7	M	—	B	B	B	B	B	B	B	B
6	BM	BM	—	BM	BM	BM	BM	BM	BM	BM
5	M	—	B	B	B	M	—	B	B	B
4	BM	—	—	BM	BM	BM	M	BM	M	M
3	M	—	B	B	—	M	—	B	—	—
2	M	—	—	M	M	M	M	M	M	M
1	M	—	—	—	—	M	—	B	M	—

M — Make
B — Break   See Reqt 2.11

BM— Break Make — See Reqt 2.11 and 2.12

TABLE A — SPRING COMBINATION FIGURE NUMBERS AND CONTACT POSITIONS (Cont)

CONTACT POSITIONS	SPRING COMBINATION FIGURE NUMBERS									
	31	32	33	34	35	36	37	38	39	40
12	BM	—	—	BM	M	—	—	—	—	B
11	M	—	—	M	M	—	—	—	—	B
10	BM	M	M	BM	M	M	—	—	—	M
9	—	—	B	M	B	B	—	—	—	B
8	BM	BM	M	BM	M	M	M	M	M	M
7	B	B	B	M	B	B	B	B	B	B
6	BM	BM	M	BM	M	M	M	M	M	M
5	—	—	B	M	B	B	—	—	B	B
4	BM	M	M	BM	M	M	—	M	M	M
3	M	—	B	M	B	—	—	—	—	B
2	BM	—	—	BM	M	M	—	—	—	M
1	M	—	—	M	M	—	—	—	—	B
	41	42	43	44	45	46	47	48	49	50
12	—	M	—	—	—	—	—	M	M	—
11	—	B	—	—	—	—	—	M	M	—
10	—	M	—	—	—	—	—	M	BM	—
9	—	B	B	—	B	—	—	—	—	—
8	M	BM	M	M	M	M	—	M	BM	BM
7	B	B	B	B	B	—	B	B	—	—
6	M	BM	M	BM	M	M	—	M	BM	BM
5	B	B	B	—	B	—	—	—	—	—
4	—	M	—	M	M	M	—	M	BM	BM
3	—	B	B	—	—	—	—	—	—	—
2	—	M	—	—	—	—	—	M	M	—
1	—	B	—	—	—	—	—	M	M	—
	51	52	53	54	55	56	57	58	59	60
12	M	—	—	—	—	B	—	B	BM	—
11	M	—	—	—	—	—	BM	—	B	BM
10	M	B	—	M	B	B	M	M	BM	—
9	B	—	—	—	—	—	BM	—	B	BM
8	M	—	—	BM	M	M	—	B	BM	—
7	B	—	—	—	—	—	BM	—	B	BM
6	BM	M	B	BM	BM	BM	B	—	BM	BM
5	B	—	—	—	—	—	BM	—	B	BM
4	M	—	—	M	M	M	M	—	BM	—
3	—	—	—	—	—	—	BM	—	B	BM
2	M	—	—	B	—	B	M	BM	BM	—
1	M	—	—	—	—	—	BM	—	B	BM

M — Make
B — Break See Reqt 2.11.

BM — Break Make — See Reqt 2.11 and 2.12.

TABLE A — SPRING COMBINATION FIGURE NUMBERS AND CONTACT POSITIONS (Cont)

CONTACT POSITIONS	SPRING COMBINATION FIGURE NUMBERS									
	61	62	63	64	65	66	67	68	69	70
12	M	M	M	BM	M	M	M	M	—	BM
11	M	M	M	BM	—	—	—	—	—	BM
10	M	BM	BM	BM	M	M	M	M	B	BM
9	M	—	M	BM	—	—	—	B	—	—
8	BM	BM	BM	BM	M	M	B	M	BM	BM
7	M	—	M	BM	—	B	—	B	—	—
6	BM	BM	BM	BM	BM	M	B	M	BM	BM
5	M	—	M	BM	—	—	—	B	—	—
4	M	BM	BM	BM	M	M	M	M	BM	BM
3	M	M	M	BM	—	—	—	—	—	—
2	M	M	M	BM	M	M	M	M	—	BM
1	M	M	M	BM	—	M	—	—	—	BM

CONTACT POSITIONS	71	72	73	74	75	76	77
12	—	—	M	—	B	—	BM
11	—	—	—	—	—	—	BM
10	M	M	M	—	—	M	BM
9	—	—	—	—	—	—	M
8	M	M	M	BM	—	BM	BM
7	—	B	B	—	—	B	M
6	B	BM	BM	BM	—	BM	BM
5	—	B	—	—	—	B	M
4	M	M	M	M	—	M	BM
3	—	—	—	—	—	—	M
2	M	M	M	—	M	M	BM
1	—	—	M	—	M	—	BM

CONTACT POSITIONS	200	201	202	203	204	205	206	207	208	209
12	—	—	—	—	M	EMB	EM	—	EMB	—
11	—	—	—	—	—	M	M	—	—	—
10	M	—	—	EBM	M	EBM	M	—	EBM	—
9	—	—	—	—	—	—	—	—	—	—
8	EBM	EBM	EBM	EBM	EBM	EBM	EBM	EBM	EBM	—
7	B	—	B	—	B	—	—	—	—	—
6	EMB	EBM	EMB	EBM	EBM	EMB	EMB	EMB	EMB	EBM
5	B	—	—	—	—	—	—	—	—	—
4	EBM	—	M	EBM	EBM	EBM	EBM	EBM	EBM	—
3	—	—	—	—	—	—	M	—	—	—
2	M	—	—	—	M	EBM	M	—	EBM	—
1	—	—	—	—	M	M	M	—	—	—

M — Make
B — Break

See Reqt 2.11.

BM — Break Make
EBM — Early Break Make
EMB — Early Make Break

See Reqt 2.11 and 2.12.

TABLE A — SPRING COMBINATION FIGURE NUMBERS AND CONTACT POSITIONS (Cont)

CONTACT POSITIONS	SPRING COMBINATION FIGURE NUMBERS									
	210	211	212	213	214	215	216	217	218	219
12	M	—	EM	EM	EM	EM	—	EBM	—	EMB
11	—	—	M	—	—	—	—	—	—	M
10	M	—	EBM	M	M	M	—	EBM	M	M
9	—	—	—	B	—	—	—	—	—	BM
8	EBM	EBM	EBM	EBM	EBM	EBM	M	EBM	EBM	M
7	—	—	B	B	B	B	—	—	B	BM
6	EBM	EMB	EMB	EMB	EMB	EMB	EMB	EBM	EMB	EMB
5	—	—	—	B	—	B	—	—	—	BM
4	M	—	EBM	EBM	M	M	M	EBM	M	M
3	—	—	—	—	—	—	—	—	—	BM
2	M	—	M	M	M	M	—	EBM	—	M
1	—	—	M	—	—	M	—	—	—	M
	220	221	222	223	224	225	226	227	228	229
12	EBM	EM	EM	EM	EMB	—	EMB	EBM	—	—
11	EBM	—	—	M	M	—	BM	M	—	—
10	EBM	M	M	M	EBM	M	EBM	EBM	M	—
9	EBM	—	—	—	—	—	M	M	B	B
8	EBM	EBM	EBM	EBM	EBM	EBM	EBM	EBM	EBM	M
7	EBM	—	B	B	B	—	—	B	B	B
6	EBM	EMB	EMB	EMB	EMB	EMB	EMB	EBM	EMB	EMB
5	EBM	—	—	—	—	—	M	M	B	B
4	EBM	M	M	M	EBM	M	EBM	EBM	M	M
3	EBM	—	—	M	M	—	BM	M	B	—
2	EBM	M	M	M	EBM	—	EBM	EBM	M	—
1	EBM	—	M	M	M	—	BM	M	—	—
	230	231	232	233	234	235	236	237	238	239
12	M	M	—	—	EBM	EM	EM	—	—	EMB
11	M	M	—	—	EBM	M	—	—	EMB	—
10	EBM	EBM	M	M	EBM	M	M	M	—	EBM
9	B	M	—	—	EBM	M	B	—	EMB	—
8	EBM	EBM	M	EBM	EMB	EBM	EBM	EBM	—	EBM
7	B	B	—	B	—	M	B	—	BM	B
6	EBM	EBM	EMB	EBM	EMB	EMB	B	EBM	EBM	EMB
5	B	B	—	B	—	M	BM	—	BM	—
4	EBM	EBM	M	M	EBM	EBM	M	M	—	EBM
3	—	M	—	—	EBM	M	—	—	EMB	—
2	M	M	M	—	EBM	M	M	—	—	EBM
1	M	M	—	—	EBM	M	M	—	EMB	M

M — Make
B — Break

See Reqt 2.11.

BM — Break Make
EM — Early Make
EBM — Early Break Make
EMB — Early Make Break

See Reqt 2.11 and 2.12.

TABLE A – SPRING COMBINATION FIGURE NUMBERS AND CONTACT POSITIONS (Cont)

CONTACT POSITIONS	SPRING COMBINATION FIGURE NUMBERS									
	240	241	242	243	244	245	246	247	248	249
12	—	M	—	EM	EM	—	—	M	EM	EBM
11	—	M	—	M	M	—	—	M	—	EBM
10	EBM	EBM	—	M	M	EBM	—	M	M	EBM
9	—	M	—	—	M	B	—	—	—	EBM
8	EMB	EBM	M	EBM	EBM	EBM	EBM	EBM	M	EMB
7	—	—	B	B	B	B	B	B	B	EBM
6	EMB	EBM	EBM	EMB	EMB	EBM	EBM	EMB	EMB	EMB
5	EM	M	B	—	B	B	B	—	B	EMB
4	EB	EBM	M	EBM	M	EBM	M	EBM	M	EBM
3	—	M	—	—	M	B	—	M	—	EBM
2	—	M	—	M	M	M	—	M	M	EBM
1	—	M	—	M	M	—	—	M	—	EBM
	250	251	252	253	254	255	256	257	258	259
12	EM	—	EMB	—	EBM	EM	—	EM	—	EBM
11	B	—	M	—	EBM	M	—	M	—	EBM
10	EBM	—	EBM	M	EBM	M	M	EBM	—	EBM
9	B	—	M	—	—	—	B	M	—	EBM
8	EBM	EBM	EBM	EBM	EMB	M	EBM	EBM	EMB	EM
7	B	B	—	—	—	B	B	—	—	—
6	EMB	EMB	EMB	EMB	EMB	EM	EMB	EMB	EMB	EMB
5	B	B	—	—	—	B	B	M	—	EM
4	EBM	—	EBM	EBM	EBM	M	EBM	EBM	M	EBM
3	B	—	M	—	—	M	B	M	—	EBM
2	M	—	EBM	—	EBM	M	—	EBM	—	EBM
1	M	—	M	—	EBM	M	—	M	—	EBM
	260	261	262	263	264	265	266	267	268	269
12	—	M	M	M	—	EM	EM	—	M	M
11	—	M	M	M	—	B	M	—	M	—
10	—	M	EBM	EBM	M	EBM	M	M	M	M
9	EB	—	M	—	B	B	B	—	M	—
8	EMB	EBM	EMB	EBM	EBM	EBM	M	EBM	EBM	EMB
7	EB	B	—	B	B	B	B	—	—	—
6	EMB	EBM	EMB	EBM	EBM	EMB	EM	EBM	EBM	EMB
5	B	B	—	—	B	B	B	—	—	EM
4	M	M	EBM	EBM	M	EBM	M	EBM	EBM	—
3	—	M	M	—	—	B	—	—	M	—
2	—	M	EBM	M	—	EBM	M	—	M	M
1	—	M	M	M	—	—	M	—	M	—

M — Make
B — Break

See Reqt 2.11.

EB — Early Break
EM — Early Make
EBM — Early Break Make
EMB — Early Make Break

See Reqt 2.11 and 2.12.

TABLE A – SPRING COMBINATION FIGURE NUMBERS AND CONTACT POSITIONS (Cont)

CONTACT POSITIONS   **SPRING COMBINATION FIGURE NUMBERS**

CONTACT POSITIONS	270	271	272	273	274	275	276	277	278	279
12	EM	EMB	B	—	—	EBM	EMB	EM	EB	EMB
11	M	M	—	—	—	EBM	—	B	EBM	—
10	M	EBM	EBM	EBM	M	EBM	EBM	M	EBM	M
9	M	—	—	B	—	EB	—	B	EBM	B
8	EBM	EBM	EBM	EBM	EBM	—	EBM	EBM	B	M
7	B	B	—	B	—	M	—	B	M	B
6	EMB	EMB	EMB	EBM	B	EMB	EMB	EMB	B	EMB
5	M	—	—	B	—	—	—	B	EMB	B
4	EBM	EBM	EBM	EBM	M	EBM	M	M	M	M
3	M	—	—	B	—	EB	B	B	EBM	—
2	M	EBM	—	—	EBM	EBM	EBM	M	EBM	—
1	M	M	—	—	—	EBM	B	BM	EBM	—

CONTACT POSITIONS	280	281	282	283	284	285	286	287	288	289
12	M	EM	—	M	—	M	M	—	—	M
11	—	M	—	M	—	M	—	—	—	M
10	M	M	M	M	M	M	EBM	M	M	M
9	—	BM	—	BM	—	B	—	—	—	—
8	EBM	—	EMB	EBM	B	EBM	B	EMB	EBM	EM
7	B	BM	—	BM	—	B	—	—	—	M
6	EBM	—	EMB	EBM	B	EBM	B	EMB	EMB	EM
5	B	BM	—	BM	—	B	—	EM	—	EM
4	EBM	M	M	EBM	EBM	M	EBM	—	M	—
3	—	BM	—	M	—	M	—	—	—	M
2	M	M	M	M	M	M	M	M	M	M
1	—	M	—	M	—	M	—	—	—	M

CONTACT POSITIONS	290	291	292	293	294	295	296	297	298	299
12	EMB	B	—	—	—	—	—	—	M	EBM
11	—	M	—	—	—	—	—	—	M	EMB
10	EB	EBM	—	—	M	M	M	M	EBM	EBM
9	—	—	—	B	—	—	B	—	M	EMB
8	EB	EBM	EBM	EBM	EBM	M	M	EMB	EBM	EBM
7	—	—	B	B	—	B	B	EB	M	BM
6	EMB	EMB	EMB	EBM	EBM	EMB	EMB	EMB	EBM	EBM
5	—	—	B	B	—	B	B	—	M	BM
4	EBM	—	M	M	M	M	M	EBM	EBM	EBM
3	—	B	—	B	—	—	—	—	M	EMB
2	—	EBM	—	—	M	M	—	—	M	EBM
1	—	BM	—	—	—	—	—	—	M	EMB

M — Make
B — Break

See Reqt 2.11.

BM — Break Make
EB — Early Break
EM — Early Make
FBM — Early Break Make
EMB — Early Make Break

See Reqt 2.11 and 2.12.

TABLE A — SPRING COMBINATION FIGURE NUMBERS AND CONTACT POSITIONS (Cont)

CONTACT
POSITIONS   SPRING COMBINATION FIGURE NUMBERS

Position	300	301	302	303	304	305	306	307	308	309
12	—	—	EM	—	EM	EM	EM	M	EM	EM
11	—	—	—	—	BM	—	M	M	B	—
10	M	EBM	—	M	M	M	EBM	EBM	M	M
9	—	M	BM	—	B	B	B	—	BM	B
8	EBM	EBM	—	EMB	M	EBM	EBM	EBM	—	EBM
7	—	M	BM	—	B	B	B	—	B	B
6	EBM	EBM	—	EMB	EM	EMB	EMB	EBM	—	B
5	—	M	BM	—	B	B	B	—	B	BM
4	EBM	EBM	—	EBM	M	EBM	EBM	EBM	M	EBM
3	—	M	—	—	B	—	B	—	BM	—
2	M	M	—	M	M	M	M	EBM	M	M
1	—	—	—	—	M	M	M	M	M	M

Position	310	311	312	313	314	315	316	317	318	319
12	EM	EBM	EM	M	EBM	—	EBM	—	—	—
11	—	EBM	—	M	BM	—	M	—	EMB	M
10	M	EBM	M	EBM	EBM	—	EBM	M	—	M
9	B	—	—	EB	M	B	M	B	EMB	—
8	EB	B	EBM	EMB	EBM	—	EMB	EBM	EBM	EBM
7	B	—	B	EB	—	B	EB	B	BM	—
6	B	EMB	EMB	EMB	EBM	EBM	EMB	EBM	EBM	EMB
5	B	—	—	B	—	B	—	B	BM	—
4	M	M	EBM	EBM	M	—	EBM	M	—	M
3	B	EB	—	EB	BM	—	M	B	EMB	—
2	M	EBM	M	M	EBM	—	EBM	M	—	M
1	—	EBM	—	M	BM	—	M	B	EMB	M

Position	320	321	322	323	324	325	326	327	328	329
12	EM	M	M	EBM	—	—	EBM	EM	—	—
11	BM	M	EMB	M	—	—	BM	—	—	M
10	M	M	—	EBM	EBM	EBM	EBM	M	EBM	M
9	B	—	B	—	—	—	M	—	M	—
8	EBM	EBM	—	—	EBM	M	EBM	M	EBM	M
7	B	B	B	M	—	—	M	—	M	B
6	EM	EBM	EB	EMB	EMB	EM	EBM	EMB	EMB	EMB
5	B	B	B	—	—	—	M	—	M	B
4	EBM	M	—	M	EBM	M	EBM	M	EBM	M
3	M	B	B	—	—	—	BM	—	M	—
2	EBM	M	M	EBM	EBM	EBM	EBM	M	EBM	—
1	M	M	EMB	M	—	—	BM	M	—	M

M — Make
B — Break

See Reqt 2.11.

BM — Break Make
EB — Early Break
EM — Early Make
EBM — Early Break Make
EMB — Early Make Break

See Reqt 2.11
and 2.12.

TABLE A — SPRING COMBINATION FIGURE NUMBERS AND CONTACT POSITIONS (Cont)

CONTACT POSITIONS   SPRING COMBINATIONS FIGURE NUMBERS

CONTACT POSITIONS	330	331	332	333	334	335	336	337	338	339
12	EMB	M	M	M	—	—	EBM	EMB	M	EMB
11	M	—	M	EM	M	—	EBM	—	M	—
10	EBM	M	M	M	M	EBM	EBM	M	M	M
9	M	—	EB	EM	M	—	EBM	—	BM	—
8	EBM	EBM	EMB	M	B	EBM	EBM	EBM	EBM	—
7	M	EB	EB	EM	EBM	—	EBM	—	B	—
6	EM	EBM	EMB	M	B	EBM	EBM	EMB	—	—
5	M	EB	B	EM	EMB	—	EBM	B	BM	B
4	EBM	—	EBM	M	EBM	EBM	EBM	M	EBM	—
3	M	M	EBM	EM	M	—	EBM	—	M	BM
2	M	M	M	M	M	M	EBM	EBM	M	M
1	M	M	M	EM	M	—	EBM	—	M	M

CONTACT POSITIONS	340	341	342	343	344	345	346	347
12				EBM		M	EBM	EM
11				M		—	EBM	—
10				EBM		M	EBM	—
9				M		—	EBM	—
8				EBM		EBM	EBM	M
7				M		—	B	—
6				EBM		M	EBM	EMB
5				M		B	BM	B
4				EBM		M	EBM	—
3				M		—	EBM	B
2				EBM		M	EBM	M
1				M		—	EBM	—

CONTACT POSITIONS	348	349	350	351	352
12	—	M	M	—	M
11	—	EMB	M	—	—
10	M	EBM	M	—	EBM
9	—	EM	M	—	—
8	M	M	EBM	EBM	EMB
7	B	B	M	B	EB
6	EM	EBM	EBM	EM	EMB
5	—	B	M	—	B
4	M	M	EBM	EBM	EBM
3	—	EMB	M	—	—
2	—	M	M	—	M
1	—	EMB	M	—	—

M — Make
B — Break

See Reqt 2.11.

BM — Break Make
EB — Early Break
EM — Early Make
EBM — Early Break Make
EMB — Early Make Break

See Reqt 2.11 and 2.12.

TABLE A — SPRING COMBINATION FIGURE NUMBERS AND CONTACT POSITIONS (Cont)

CONTACT POSITIONS	SPRING COMBINATIONS FIGURE NUMBERS									
	400	401	402	403	404	405	406	407	408	409
12	—	—	—	EM		—	EM	PBEM	—	—
11	—	—	—	—		—	—	—	—	—
10	M	EBM	EBM	EBM		EBM	EBM	—	EBM	M
9	—	PM	—	—		—	—	—	PMEB	—
8	EMB	—	—	EMB		—	EMB	EMB	EMB	EMB
7	B	—	—	B		—	B	—	BM	B
6	EBM	EBM	EBM	EBM		—	EBM	EBM	EBM	EBM
5	B	—	—	B		—	B	BM	BM	B
4	PM	PM	PM	PM		—	PM	—	PMEB	PM
3	—	M	—	—		—	B	B	BM	B
2	—	—	—	EM		PBEM	EM	EM	EM	—
1	—	—	—	—		—	—	B	—	—
	410	411	412	413	414	415	416	417	418	419
12	PB	—	PBEM	EM	PBEM	PBEM	—	PB	EM	—
11	M	BM	—	BM	BM	—	M	M	BM	M
10	M	EBM	—	M	EBM	EBM	EBM	EB	EBM	EBM
9	—	—	—	PMEB	PMEB	—	—	PM	—	—
8	EMB	EM	EMB	EMB	EMB	EMB	EMB	—	EM	EMB
7	—	B	—	B	BM	—	B	M	—	B
6	EBM	EBM	—	M	EBM	EBM	EBM	EBM	EBM	EBM
5	B	B	—	B	BM	—	B	M	—	B
4	—	PM	—	PMEB	PMEB	—	PM	—	PM	PMEB
3	—	B	—	M	BM	BM	—	M	BM	—
2	PBEM	EM	PBEM	PBEM	PBEM	PBEM	EM	PB	EM	PBEM
1	M	BM	—	M	BM	BM	M	M	M	M
	420	421	422	423	424	425	426	427		
12	EM	—	EM	PB	—	EMPB	EBM	EM		
11	B	—	B	M	BM	—	EBM	M		
10	M	M	M	EB	EBM	EBM	EBM	M		
9	—	—	PMEB	PM	—	—	EBM	—		
8	EM	EMB	EM	EM	EMB	EMB	EMB	EM		
7	B	B	B	M	B	—	PMEB	B		
6	EBM	EBM	EBM	EBM	EBM	EBM	EBM	EBM		
5	B	B	B	M	B	M	EMB	—		
4	PM	PM	PM	—	PMEB	—	EBM	PM		
3	B	B	B	M	—	B	EBM	M		
2	EM	EM	EM	PB	PBEM	—	EBM	EM		
1	B	—	B	M	M	M	EBM	M		

M — Make
B — Break

See Reqt 2.11.

BM — Break Make
EB — Early Break
EM — Early Make
PM — Preliminary Make

See Reqt 2.11 and 2.12.

PB — Preliminary Break
EBM — Early Break Make
EMB — Early Make Break
PBEM — Preliminary Break Early Make
PMEB — Preliminary Make Early Break

See Reqt 2.11 and 2.12.

TABLE A — SPRING COMBINATION FIGURE NUMBERS AND CONTACT POSITIONS (Cont)

CONTACT POSITIONS	SPRING COMBINATION FIGURE NUMBER	
	500	501
12 & 24	M	B
11 & 23	M	B
10 & 22	M	B
9 & 21	M	B
8 & 20	M	B
7 & 19	M	B
6 & 18	M	B
5 & 17	M	B
4 & 16	M	B
3 & 15	M	B
2 & 14	M	B
1 & 13	M	B

M — Make   See Reqt 2.11.